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NEW GYNANDROMORPH OF *COLIAS PHILODICE* FROM COLORADO

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A SEXUAL MOSAIC of *Colias philodice* was taken at Big Spring Ranch, near Florissant, Teller County, Colorado, on July 25, 1960. The gynandromorph (Figure 1) has the wings on both sides largely male, with good development of the female marginal spotting pattern in the margins of the right forewing and to a lesser extent on the left forewing. The secondaries are entirely male in character. The specimen is in freshly emerged condition. This gynandromorph appears to be the first recorded from Colorado populations of *Colias philodice* Godart. (The yellow Colorado form is called *Colias eriphyle* by Brown *et al*, 1957 and *Colias philodice hageni* by Hovanitz, 1951).

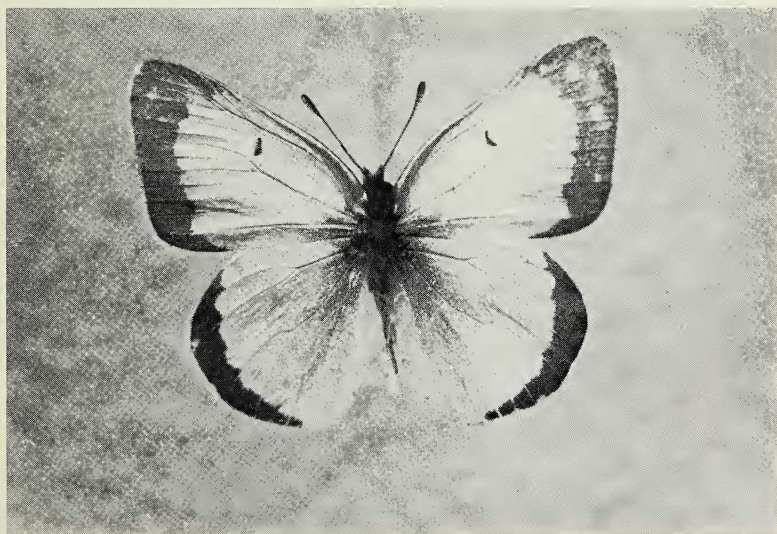


Figure 1. Sexual gynandromorph of *Colias philodice* from Colorado.

The secondary sexual characters in *Colias* species have been indicated to be independent of control by gonadal hormones circulating in the blood (review by Remington, 1954), as non-uniform distribution of color occurs in such partial gynandromorphs as the specimen reported here. The distribution of female characters in this specimen thus adds to the previous evidence that the chromosomal complement of each pigment-producing cell controls the female or male characters in wing pigmentation; that is, the sexual characters for pattern may be assumed to be under local intracellular control rather than general extracellular hormonal control. If present specimen developed as a male (with two X- chromosomes) and the loss of one X- chromosome occurred late in development of the wing imaginal discs, the tissue arising as a result would give rise to marginal female (XO) characters in the forewings of the imago.

LITERATURE CITED

- BROWN, F. MARTIN, DONALD EFF and BERNARD ROTGER. 1957. *Colorado Butterflies*. Denver Museum of Natural History. 368 pp.
- HOVANITZ, W. 1951. The Biology of *Colias* Butterflies. I. The distribution of the North American species. *Wasmann J. Biol.* 8: 49-75.
- REMINGTON, CHARLES L. 1954. The genetics of *Colias* (Lepidoptera). *Advances in Genetics* 6: 403-450.